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# **WATER SUPPLY OUTLOOK FOR MONTANA**

and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

UNITED STATES DEPARTMENT of AGRICULTURE--SOIL CONSERVATION SERVICE,  
and  
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State, and private organizations listed on the inside back cover of this report.

AS OF  
FEB. 1, 1969



## TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

## PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, Western Regional Technical Service Center, Room 209, 701 N. W. Glisan, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	P. O. Box "F", Palmer, Alaska 99645
Arizona	6029 Federal Building, Phoenix, Arizona 85205
Colorado (N. Mex.)	12417 Federal Building, Denver, Colorado 80521
Idaho	P. O. Box 38, Boise, Idaho 83707
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1218 S. W. Washington St., Portland, Oregon 97205
Utah	4012 Federal Building, Salt Lake City, Utah 84111
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 340, Casper, Wyoming 82602

## PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P. O. Box 388, Sacramento, California 95802 --- and for British Columbia by the Department of Lands, Forests and Water Resources, Water Resources Service, Parliament Building, Victoria, British Columbia



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and  
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

*Issued by*

**KENNETH E. GRANT**

ADMINISTRATOR  
SOIL CONSERVATION SERVICE  
WASHINGTON, D.C.

|||||

*Released by*

**A. B. LINFORD**

STATE CONSERVATIONIST  
SOIL CONSERVATION SERVICE  
Bozeman, Montana

*In Cooperation with*

**J. A. ASLESON**

DIRECTOR  
Montana Agricultural Experiment Station

|||||

*Report prepared by*

**P. E. FARNES, Snow Survey Supervisor**

SOIL CONSERVATION SERVICE  
P.O. Box 98  
Bozeman, Montana 59715



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# MONTANA WATER SUPPLY OUTLOOK

February 1, 1969

\* \* \* \* \*  
\*  
\* Mountain snow pack in Montana is above average, \*  
\* mountain soils are wet, valley floors are snow \*  
\* covered, reservoir storage is generally above \*  
\* average - all indicators for good to excellent \*  
\* spring and summer water supplies for Montana. \*  
\*  
\* \* \* \* \*

## COLUMBIA RIVER DRAINAGE

Snow - The mountain snow pack is well above average along the Continental Divide in the Blackfoot River headwaters, and along the Montana-Idaho border in the Lower Clark Fork area. Snow pack in the Kootenai River headwaters is increasing to above average in the Montana portion of the drainage. The remainder of the Columbia River drainage in Montana is 10 to 30 percent above average.

Soil moisture is generally above average and will increase runoff normally expected from the snow pack.

Streamflow - Water supply forecasts are not prepared until after March 1 snow surveys, but present indications are for runoff in the Kootenai River to be 110 to 115 percent average. The Upper Clark Fork, Blackfoot and Bitterroot Rivers are about 125 to 130 percent; the Flathead River and tributaries, 110 to 120 percent average. Combined the flow is about 120 to 125 percent average for the Clark Fork below the junction with the Flathead River.



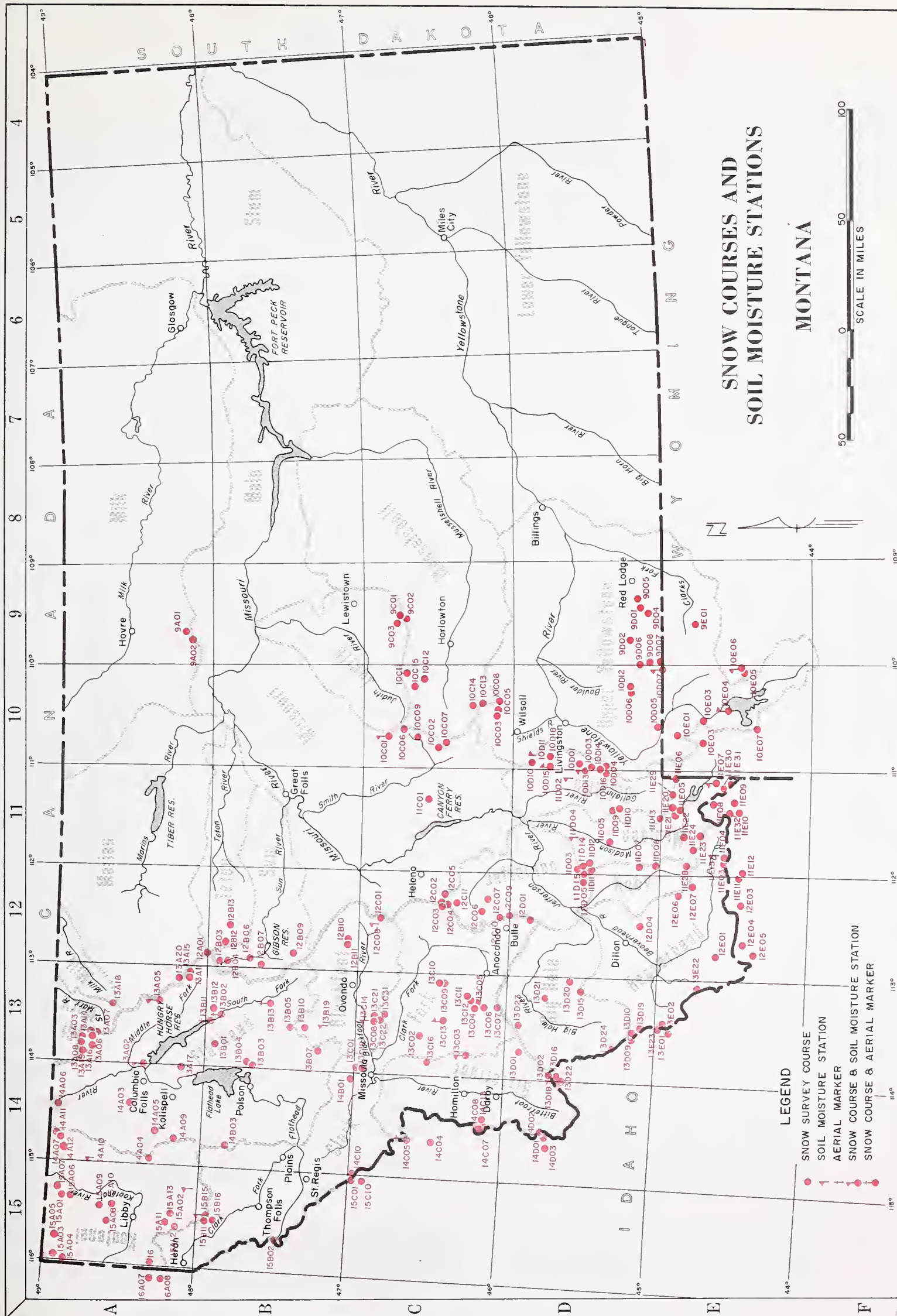
## MISSOURI RIVER DRAINAGE

Snow - Surveys are made at only a portion of the snow courses for February, but heavy snow pack is indicated in the headwaters of the Red Rock River along the Continental Divide, along the Missouri main stem, and in the Yellowstone River headwaters. The remainder of the Missouri River drainage appears to have well above average snow pack. Many snow courses now have snow water equivalents greater than their April 1 average. Mountain soils under the snow pack are wetter than normal and will require less snow melt for recharge.

Streamflow - Water supply forecasts are not prepared until after March 1 snow surveys. It is likely that all streams in the Missouri River will flow 10 to 30 percent above average. Some smaller streams, particularly the Red Rock and Beaverhead Rivers will probably have flows greater than 130 percent of average, depending on snowfall for the next two months and precipitation during the spring melt. Depending on temperatures and other climatic conditions, snow on the valley floors could provide some runoff between now and April.

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SNOW COURSES

Drainage basin & Course Name	Number	Elev.	Sec.	Typ.	Range	Record Begin	Monauring Dates $\frac{1}{2}$	Meas. By $\frac{1}{2}$	Drainage Basin & Course Name	Number	Elev.	Sec.	Typ.	Range	Record Begin	Monauring Dates $\frac{1}{2}$	Meas. By $\frac{1}{2}$
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COLUMBIA RIVER BASIN

KOOTENAI RIVER	15A11	5700	6	27N	31W	1969	3,4,5	1	RUBY RIVER	11D14	8850	5	4S	3W	1967	3,4,5	1,1,2		
	15A08	5600	4	28N	31W	1969	1,2,3,4,5,5,6	1		11D08	8600	28	9S	2W	1963	3,4,5	1		
	15A07	5600	36	28N	31W	1966	3,4,5	2		12E07	7900	14	12S	4W	1963	3,4,5	1		
	15B10	4600	31	26N	30W	1966	3,4,5,5,6	2		11D15	7850	17	4S	3W	1967	3,4,5	1,1,2		
	15B15	3800	5	25N	30W	1966	3,4,5,5,6	2		12E06	8500	18	11S	4W	1963	3,4,5	1		
	15A10	4200	3	32N	30W	1969	1,2,3,4,5,5,6	1		12D05	6960	24	4S	3W	1967	3,4,5	1,1,2		
	15A13	5000	12	30N	26W	1937	3,4,5	1,2		BIG HOLE RIVER	13D20	8800	7	3S	11W	1963	3,4,5	1	
	15A14	4300	35	28N	31W	1969	1,2,3,4,5,5,6	1			13D19	8600	4	8S	16W	1963	3,4,5	1	
	15A06	6100	9	36N	29W	1969	1,2,3,4,5,5,6	1			13D18	8280	11	1S	11W	1963	3,4,5	1	
	15A07	5200	35	37N	28W	1969	1,2,3,4,5,5,6	1			13D21	8250	11	3S	2N	15W	1967	3,4,5	1
	15A05	4250	18	37N	27W	1937	1,2,3,4,5,5,6	1,2			13D22	8750	29	5S	17W	1968	3,4,5	1	
	15A11	4300	1	36N	25W	1937	3,4,5,5,6	1	JEFFERSON RIVER		12C07	7300	8	5N	5W	1962	3,4,5	1	
	15A03	6550	18	37N	37W	1969	1,2,3,4,5,5,6	1			12C09	7700	11	3N	7W	1966	3,4,5	1	
	15A09	3300	25	30N	35W	1969	1,2,3,4,5,5,6	1			12C10	6500	21	6N	6W	1967	3,4,5	1	
	15A09	5000	31	33N	29W	1969	1,2,3,4,5,5,6	1			12C16	6800	21	6N	6W	1967	3,4,5	1	
	15A12	5100	5	27N	31W	1969	1,2,3,4,5,5,6	1,2			MISSOURI RIVER	11D12	6900	5	4S	2W	1965	3,4,5	1
	15A11	5000	4	36N	25W	1937	3,4,5,5,6	1		11D13		7000	11	4N	10E	1937	3,4,5,5,6	1	
	15A12	6950	5	36N	25W	1937	3,4,5,5,6	1,2		11D14		7890	2	8S	18E	1937	3,4,5,5,6	1	
	15A07	5450	20	37N	24W	1937	3,4,5,5,6	1,2		11D15		8150	19	9S	15E	1936	3,4,5	2	
	FLATHEAD RIVER	15B03	5150	24N	25W	1961	3,4,5	1,5		11D16		8400	22	9S	9E	1935	3,4,5	2	
		15B04	5900	31	28N	1964	3,4,5	2	11D17	9007		21	9S	14E	1936	3,4,5	2		
		15B05	6750	7	22N	18W	1941	3,4,5, 6	1,5	11D18		9006	11	9S	14E	1936	1,2,3,4,5,5,6	1,2	
		15B06	5400	24	31N	19W	1937	1,2,3,4,5	6	11D19		9005	10	7S	19E	1961	1,2,3,4,5	1	
		15B07	5900	8	22N	18W	1962	3,4,5	6	11D20	9005	10	7S	19E	1961	1,2,3,4,5	1		
15B08		6300	12	25N	18W	1968	3,4,5	6	11D21	9005	10	7S	19E	1961	1,2,3,4,5	1			
15A09		5150	31	28N	25W	1960	3,4,5	1,5	11D22	8800	22	7S	12E	1961	3,4,5	1			
15A05		5250	34	30N	14W	1934	1,2,3,4,5	1	11D23	7850	22	7S	12E	1961	3,4,5	1			
CLARK FORK RIVER	15A16	4000	29	35N	17W	1957	3,4,5	6	11D24	7600	33	9S	4N	10E	1937	1,2,3,4,5,5,6	1,6		
	15B07	6330	30	17N	17W	1941	3,4,5,5,6	1,5	11D25	10047	7400	33	9S	4N	10E	1938	3,4,5,5,6	1	
	15B02	7000	23	25N	15W	1948	1,2,3,4,5,5,6	1,5	11D26	10073	6500	10	4N	10E	1938	3,4,5	1		
	15B01	6100	9	25N	15W	1948	1,2,3,4,5	1	11D27	10010	6550	36	2N	6E	1960	3,4,5	1		
	15B01	5980	42	25N	16W	1948	1,2,3,4,5	8	11D28	10008	8100	13	4N	10E	1965	3,4,5	1		
	13C04	8450	6	3N	12W	1951	2,3,4,5	4	11D29	8850	10	7S	18E	1961	3,4,5	1			
	13C04	8450	6	3N	12W	1951	1,2,3,4,5	8	11D30	9002	7500	9	8S	16E	1960	3,4,5	1		
	13C04	4650	23	13N	15W	1951	1,2,3,4,5	8	11D31	9002	7500	9	8S	16E	1960	3,4,5	1		
	13C31	6450	11	13N	15W	1951	1,2,3,4,5	8	11D32	9008	8700	18	9S	15E	1967	3,4,5	2		
	13C12	7100	22	6N	17W	1937	3,4,5,5,6	1	MISSOURI RIVER MAIN STEM	9A02	5200	21	28N	16E	1967	1,2,3,4,5	7		
	13C02	7100	35	16N	16W	1937	3,4,5	1		11C01	7950	2	9N	3E	1963	3,4,5	1		
	13C05	5900	8	25N	15W	1948	1,2,3,4,5	4		12C05	7600	3	11N	11E	1969	3,4,5	2		
	13C07	7780	19	4N	13W	1946	3,4,5,5,6	8		12C06	7600	3	11N	11E	1969	3,4,5	2		
	ST. MARY RIVER BASIN	13A18	5900	24	34N	14W	1963	3,4,5		3	12C07	7300	8	5N	5W	1962	3,4,5	1	
		13A18	5900	24	34N	14W	1963	3,4,5		3	12C09	7700	11	3N	7W	1966	3,4,5	1	
		13A03	5400	1	35N	17W	1922	3,4,5		3,9	12C10	6500	21	6N	6W	1967	3,4,5	1	
		13A14	4900	1	35N	16W	1955	5		3,9	12C16	6800	21	6N	6W	1967	3,4,5	1	
		13A07	5700	27	35N	16W	1942	5		3,9	12D06	5700	25	24N	10W	1949	3,4,5	2	
		13A08	5800	36	36N	17W	1942	5		3,9	12D07	5700	25	24N	10W	1949	3,4,5	2	
		13A09	5800	36	36N	17W	1942	5		3,9	12D08	5700	25	24N	10W	1949	3,4,5	2	
		13A10	5800	36	36N	17W	1942	5	3,9	12D09	5700	25	24N	10W	1949	3,4,5	2		
		13A11	5800	36	36N	17W	1942	5	3,9	12D10	5700	25	24N	10W	1949	3,4,5	2		
		13A12	5800	36	36N	17W	1942	5	3,9	12D11	5700	25	24N	10W	1949	3,4,5	2		
		13A13	5800	36	36N	17W	1942	5	3,9	12D12	5700	25	24N	10W	1949	3,4,5	2		
13A14		5800	36	36N	17W	1942	5	3,9	12D13	5700	25	24N	10W	1949	3,4,5	2			
13A15		5800	36	36N	17W	1942	5	3,9	12D14	5700	25	24N	10W	1949	3,4,5	2			
13A16		5800	36	36N	17W	1942	5	3,9	12D15	5700	25	24N	10W	1949	3,4,5	2			
13A17	5800	36	36N	17W	1942	5	3,9	12D16	5700	25	24N	10W	1949	3,4,5	2				
13A18	5800	36	36N	17W	1942	5	3,9	12D17	5700	25	24N	10W	1949	3,4,5	2				
13A19	5800	36	36N	17W	1942	5	3,9	12D18	5700	25	24N	10W	1949	3,4,5	2				
13A20	5800	36	36N	17W	1942	5	3,9	12D19	5700	25	24N	10W	1949	3,4,5	2				
13A21	5800	36	36N	17W	1942	5	3,9	12D20	5700	25	24N	10W	1949	3,4,5	2				
13A22	5800	36	36N	17W	1942	5	3,9	12D21	5700	25	24N	10W	1949	3,4,5	2				
13A23	5800	36	36N	17W	1942	5	3,9	12D22	5700	25	24N	10W	1949	3,4,5	2				
13A24	5800	36	36N	17W	1942	5	3,9	12D23	5700	25	24N	10W	1949	3,4,5	2				
13A25	5800	36	36N	17W	1942	5	3,9	12D24	5700	25	24N	10W	1949	3,4,5	2				
13A26	5800	36	36N	17W	1942	5	3,9	12D25	5700	25	24N	10W	1949	3,4,5	2				
13A27	5800	36	36N	17W	1942	5	3,9	12D26	5700	25	24N	10W	1949	3,4,5	2				
13A28	5800	36	36N	17W	1942	5	3,9	12D27	5700	25	24N	10W	1949	3,4,5	2				
13A29	5800	36	36N	17W	1942	5	3,9	12D28	5700	25	24N	10W	1949	3,4,5	2				
13A30	5800	36	36N	17W	1942	5	3,9	12D29	5700	25	24N	10W	1949	3,4,5	2				
13A31	5800	36	36N	17W	1942	5	3,9	12D30	5700	25	24N	10W	1949	3,4,5	2				
13A32	5800	36	36N	17W	1942	5	3,9	12D31	5700	25	24N	10W	1949	3,4,5	2				
13A33	5800	36	36N	17W	1942	5	3,9	12D32	5700	25	24N	10W	1949	3,4,5	2				
13A34	5800	36	36N	17W	1942	5	3,9	12D33	5700	25	24N	10W	1949	3,4,5	2				
13A35	5800	36	36N	17W	1942	5	3,9	12D34	5700	25	24N	10W	1949	3,4,5	2				
13A36	5800	36	36N	17W	1942	5	3,9	12D35	5700	25	24N	10W	1949	3,4,5	2				
13A37	5800	36	36N	17W	1942	5	3,9	12D36	5700	25	24N	10W	1949	3,4,5	2				
13A38	5800	36	36N	17W	1942	5	3,9	12D37	5700	25	24N	10W	1949	3,4,5	2				
13A39	5800	36	36N	17W	1942	5	3,9	12D38	5700	25	24N	10W	1949	3,4,5	2				
13A40	5800	36	36N	17W	1942	5	3,9	12D39	5700	25	24N	10W	1949	3,4,5	2				
13A41	5800	36	36N	17W	1942	5	3,9	12D40	5700	25	24N	10W	1949	3,4,5	2				
13A42	5800	36	36N	17W	1942	5	3,9	12D41	5700	25	24N	10W	1949	3,4,5	2				
13A43	5800	36	36N	17W	1942	5	3,9	12D42	5700	25	24N	10W	1949	3,4,5	2				
13A44	5800	36	36N	17W	1942	5	3,9	12D43	5700	25	24N	10W	1949	3,4,5	2				
13A45	5800	36	36N	17W	1942	5	3,9	12D44	5700	25	24N	10W	1949	3,4,5	2				
13A46	5800	36	36N	17W	1942	5	3,9	12D45	5700	25	24N	10W	1949	3,4,5	2				
13A47	5800	36	36N	17W	1942	5	3,9	12D46	5700	25	24N	10W	1949	3,4,5	2				
13A48	5800	36	36N	17W	1942	5	3,9	12D47	5700	25	24N	10W	1949	3,4,5	2				
13A49	5800	36	36N	17W	1942	5	3,9	12D48	5700	25	24N	10W	1949	3,4,5	2				
13A50	5800	36	36N	17W	1942	5	3,9	12D49	5700	25	24N	10W							

# SNOW SURVEY DATA

AS OF FEBRUARY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
NO.	NAME	ELEVATION				LAST YEAR	AVERAGE

## COLUMBIA RIVER BASIN

### KOOTENAI RIVER

BC 10	Fernie	3500	1/31	48	11.8	4.2	7.1
BC 12A	Field	4200	1/30	24	4.7	5.3	5.5
BC 11	Glacier	4100	1/28	58	19.7	19.7	20.5
BC 43	Gray Creek	5100	1/28	50	12.6	10.3	12.4
BC 33	Kicking Horse	5400	1/30	40	10.5	10.6	11.4
BC 32	Marble Canyon	5000	1/30	45	11.3	8.4	10.6
BC 10B	Morrissey Ridge	6100				15.7	20.0*
BC 10A	New Fernie	4100				8.4	11.1
BC 8A	Sinclair Pass	4500	1/27	20	5.5	4.0	4.7
BC 20A	Sullivan Mine	5100	1/31	53	14.2	10.6	9.7

### FLATHEAD RIVER

13A02	Desert Mountain	5600	1/31	55	15.9	10.2	10.7
14A03	Hell Roaring Divide	5770	1/30	92	28.1	18.2	22.3*
13B13	Holbrook	4530	2/4	50	12.5A	6.0A	7.4
13A05	Marias Pass	5250	1/29	56	14.0	9.3	12.1
13B02	Spotted Bear Mountain	7000	2/4	56	15.0A	9.0A	10.1*
13B11	Twin Creeks	3580	2/4	57	14.0A	7.0A	8.7*

### CLARK FORK RIVER

13C13	Black Pine	7100	1/31	48	13.6	10.9	-
13C13	Black Pine Pillow	7100	1/31	SP	12.9	11.2	-
13B10	Coyote Hill	4200	2/4	41	10.1	6.8	7.8
14C10	Heart Lake Trail	4800	1/30	66	20.4	-	-
15C10	Hoodoo Basin	6000	1/30	132	44.7	31.3	-
15C10	Hoodoo Basin Pillow	6000	No Report			28.9	-
15C01	Hoodoo Creek	5900	1/30	129	41.8	27.6	-
13C04	Intergaard	6450	1/31	34	7.1	7.2	5.3
15B02	Lookout	5250	1/31	133	38.7	21.0	25.0
13C21	Lubrecht Forest No. 3	5450				5.4	5.2
13C22	Lubrecht Forest No. 4	4650				3.1	2.7
13C08	Lubrecht Forest No. 6	4040				3.2	3.3
13C05	Southern Cross	6500	1/31	28	6.5	5.7	4.4
13C18	Spring Gulch	6000				10.6	8.9*
13C07	Storm Lake	7780	1/30	46	12.0	12.4	8.5
13C06	Stuart Mill	6500	1/31	30	6.8	5.7	4.5
13C01	Stuart Mountain	7400				23.6	21.5*
14B01	TV Mountain	6800				11.4	11.8*

SP - Snow pillow observation - water content only.

A - Aerial observation - water content estimated.





# SNOW SURVEY DATA

AS OF FEBRUARY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
NO.	NAME	ELEVATION				LAST YEAR	AVERAGE

## BITTERROOT RIVER

13D02	Gibbons Pass	7100	1/28	79	22.0	14.8	15.1
14C05	Lolo Pass	5230	1/29	84	25.6	-	-
13D16	Moose Creek	6200	1/30	60	15.2	9.0	10.9
13D22	Saddle Mountain	7940	1/29	83	25.1	18.8	-
13D22	Saddle Mountain Pillow	7900	1/28	SP	25.6	17.9	-
14C04	Savage Pass	6600	1/29	78	23.3	18.5	-
14C13	Twelvemile Creek	5600	1/31	65	18.9	13.9	-
14C13	Twelvemile Creek Pillow	5600	1/31	SP	15.8	11.8	-

SP - Snow pillow observation - water content only.





# SNOW SURVEY DATA

AS OF FEBRUARY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

## MISSOURI RIVER BASIN

### BEAVERHEAD RIVER

12E03	Camp Creek	6800	1/27	55	14.5	8.0	6.3
12D04	Carter Creek	7400	2/1	22	4.2	3.4	-
11E12	Kilgore	6200	2/1	51	14.8	8.5	6.2
11E04	Lakeview Canyon	6930	1/31	71	18.4	10.1	8.3*
11E03	Lakeview Ridge	7400	1/31	64	15.5	10.7	7.7*

### JEFFERSON RIVER

12C09	Copper Mountain	7700	1/30	40	8.8	10.6	-
12C10	Nez Perce Creek	6500	1/30	27	6.1	5.1	-
12C06	Picnic Grounds	6500	1/30	23	4.6	3.9	3.1
12D01	Pipestone Pass	7200	1/30	26	5.3	4.3	3.4
12C11	Rocker Peak	8000	1/29	52	13.8	13.9	-
12C11	Rocker Peak Pillow	8000	1/29	SP	12.6	13.0	-
12C12	Uncle Sam Gulch	6500	1/29	36	8.7	8.1	-

### MADISON RIVER

11E09	Big Springs	6500	1/29	69	21.3	12.1	13.1
11E05	Hebgen Dam	6550	2/1	44	11.6	10.2	7.5
11E10	Island Park	6315	1/30	64	19.4	8.9	10.6
10E02	Norris Basin	7500	2/3	43	8.6	10.9	7.2
11E08	Valley View	6500	1/30	75	22.4	13.6	10.3
11E07	West Yellowstone	6700	2/2	49	13.4	7.7	7.4
11E07	West Yellowstone Pillow	6700	1/27	SP	9.8	7.2	-

### GALLATIN RIVER

10D14	Arch Falls	7350	1/30	37	10.0	13.6	8.0*
10D15	Bridger Bowl	7250	1/29	68	22.0	24.5	-
10D15	Bridger Bowl Pillow	7250	1/29	SP	18.3	23.7	-
10D04	Devil's Slide	8100	1/30	54	15.8	22.7	13.2*
10D03	Hood Meadow	6600	1/30	31	7.8	10.6	5.8*
10D13	Lick Creek	6860	1/30	31	6.9	11.0	6.3*
10D13	Lick Creek Pillow	6860	1/30	SP	6.7	9.8	-
10D18	Maynard Creek	6210	1/29	50	14.5	16.1	-
10D18	Maynard Creek Pillow	6210	1/29	SP	10.2	11.3	-
10D01	New World	6700	1/29	33	8.3	12.0	6.4
10D16	Shower Falls	8100	1/30	65	19.5	25.3	-
10D16	Shower Falls Pillow	8100	1/30	SP	16.7	22.0	-
11E06	Twenty-One Mile	7150	2/2	79	21.8	13.2	11.9

SP - Snow pillow observation - water content only.

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Note: All Averages Based on 1953-67, 15 year period. \*Adjusted Average



# SNOW SURVEY DATA

AS OF FEBRUARY 1, 1969

(Inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
			DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
NO.	NAME	ELEVATION				LAST YEAR	AVERAGE

## MISSOURI RIVER (Main Stem)

12C05	Chessman Reservoir	6200	1/31	24	5.8	6.4	2.6*
10C09	Deadman Creek	6450	2/4	40	9.4	9.2	-
10C09	Deadman Creek Pillow	6450	2/4	SP	8.9	8.2	-
9A01	Rocky Boy	4700				5.0	-
9A01	Rocky Boy Pillow	4700				4.4	-
12C02	Ten Mile Lower	6600	1/31	36	8.8	7.5	4.6
12C03	Ten Mile Middle	6800	1/30	42	11.2	9.4	6.9
12C04	Ten Mile Upper	8000	2/3	48	14.0	13.0	8.8

## JUDITH RIVER

10C06	Spur Park	8000	2/4	61	17.6	18.2	-
10C06	Spur Park Pillow	8000	2/4	SP	15.9	17.0	-

## ST. MARY RIVER

13A18	Hudson Bay Divide	5800	1/28	50	13.3	-	-
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## SASKATCHEWAN (Bow River)

Alb. 1	Bow River	5100	1/31	33	7.2	6.6	-
Alb. 8	Chateau Lake	5700	1/30	39	9.2	7.6	-
Alb. 6	Mirror Lake	6600	1/30	38	9.6	8.8	-
Alb. 10	Mount Eisenhower	5000	1/31	26	5.5	3.6	-
Alb. 2	Upper Pipestone	5400	1/29	31	6.2	6.0	-

## UPPER YELLOWSTONE RIVER

10E03	Canyon	7750	1/29	56	14.8	10.8	10.1
10E06	East Entrance	7000	1/28	35	8.6	4.5	7.1*
9D05	Grizzly Peak	8400	1/31	32	7.5	13.4	10.1*
10E04	Lake Camp	7850	1/30	47	10.4	5.0	5.8*
10E01	Lupine Creek	7300	2/1	44	12.3	8.4	7.1
10D07	Northeast Entrance	7400	1/30	34	8.6	6.4	6.0
10D07	Northeast Entrance Pillow	7400	1/30	SP	7.8	6.7	-
10E05	Sylvan Pass	7100	1/28	45	12.2	7.6	8.8
10E07	Thumb Divide	7900	1/29	85	23.0	14.8	14.6*
9D02	West Rosebud	7500	1/29	38	10.0	9.8	-

SP - Snow pillow observation - water content only.

# STATE OF NEW YORK

IN SENATE

January 1, 1901.

RECEIPTS						PAID	
DATE	TO WHOM PAID	FOR WHAT PURPOSE	AMOUNT	DATE	TO WHOM PAID	FOR WHAT PURPOSE	AMOUNT
1901				1901			
Jan 1	State	Salaries	100.00	Jan 1	State	Salaries	100.00
Jan 2	State	Salaries	100.00	Jan 2	State	Salaries	100.00
Jan 3	State	Salaries	100.00	Jan 3	State	Salaries	100.00
Jan 4	State	Salaries	100.00	Jan 4	State	Salaries	100.00
Jan 5	State	Salaries	100.00	Jan 5	State	Salaries	100.00
Jan 6	State	Salaries	100.00	Jan 6	State	Salaries	100.00
Jan 7	State	Salaries	100.00	Jan 7	State	Salaries	100.00
Jan 8	State	Salaries	100.00	Jan 8	State	Salaries	100.00
Jan 9	State	Salaries	100.00	Jan 9	State	Salaries	100.00
Jan 10	State	Salaries	100.00	Jan 10	State	Salaries	100.00
Jan 11	State	Salaries	100.00	Jan 11	State	Salaries	100.00
Jan 12	State	Salaries	100.00	Jan 12	State	Salaries	100.00
Jan 13	State	Salaries	100.00	Jan 13	State	Salaries	100.00
Jan 14	State	Salaries	100.00	Jan 14	State	Salaries	100.00
Jan 15	State	Salaries	100.00	Jan 15	State	Salaries	100.00
Jan 16	State	Salaries	100.00	Jan 16	State	Salaries	100.00
Jan 17	State	Salaries	100.00	Jan 17	State	Salaries	100.00
Jan 18	State	Salaries	100.00	Jan 18	State	Salaries	100.00
Jan 19	State	Salaries	100.00	Jan 19	State	Salaries	100.00
Jan 20	State	Salaries	100.00	Jan 20	State	Salaries	100.00
Jan 21	State	Salaries	100.00	Jan 21	State	Salaries	100.00
Jan 22	State	Salaries	100.00	Jan 22	State	Salaries	100.00
Jan 23	State	Salaries	100.00	Jan 23	State	Salaries	100.00
Jan 24	State	Salaries	100.00	Jan 24	State	Salaries	100.00
Jan 25	State	Salaries	100.00	Jan 25	State	Salaries	100.00
Jan 26	State	Salaries	100.00	Jan 26	State	Salaries	100.00
Jan 27	State	Salaries	100.00	Jan 27	State	Salaries	100.00
Jan 28	State	Salaries	100.00	Jan 28	State	Salaries	100.00
Jan 29	State	Salaries	100.00	Jan 29	State	Salaries	100.00
Jan 30	State	Salaries	100.00	Jan 30	State	Salaries	100.00
Jan 31	State	Salaries	100.00	Jan 31	State	Salaries	100.00



# SOIL MOISTURE DATA

AS OF FEBRUARY 1, 1969

(Inches)

SOIL MOISTURE STATION			SOIL PROFILE		CURRENT DATA		PAST RECORD	
NO.	NAME	ELEVATION	DEPTH	FIELD CAPACITY	DATE OF SURVEY	SOIL MOISTURE	LAST YEAR	**AVERAGE

## COLUMBIA RIVER BASIN

### Kootenai

15B15M	Baree Trail	3800	48	7.5			-	-
14A10M	Murphy Lake R.S.	3000	48	22.6			19.0	-
15A02M	Raven R.S.	3050	48	23.0			20.5	-

### Flathead

13A02M	Desert Mountain	5600	54	8.4	1/31	8.7	6.9	7.0
13A05M	Marias Pass	5250	54	6.5	2/1	5.6	5.4	5.1

### Clark Fork

13C13M	Black Pine	7100	48	10.0	1/31	8.7	8.0	-
13B19M	Seeley Lake R.S.	4030	48	11.9	2/4	8.3	5.1	6.8
13C03M	Skalkaho Summit	7260	48	10.8			-	-

### Bitterroot

13D18M	Gibbons Pass	7100	48	7.1	1/28	5.8	6.2	5.4
14C05M	Lolo Pass	5250	48	10.6	1/31	7.0	10.1	6.6

## MISSOURI RIVER BASIN

### Beaverhead

11E13M	Lakeview	6700	48	15.3	2/1	6.1	5.2	7.1
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### Madison

10D04M	Red Bluff	4800	40	4.7			-	-
11E07M	West Yellowstone	6700	48	6.5	1/27	3.5	2.3	-

### Gallatin

10D15M	Bridger Bowl	7250	48	17.0	1/29	13.7	15.5	-
11D02M	College Site	4856	54	14.5	1/31	12.2	10.3	9.7
10D13M	Lick Creek	6860	48	18.8	1/30	16.6	17.8	-
11E06M	Twenty-One Mile	7150	48	10.0	1/26	7.1	3.2	2.8

### Missouri Main Stem

10C01M	Kings Hill	7420	48	11.8	1/31	7.4	6.3	7.1
13C08M	Stemple Pass	6350	48	5.9	1/31	4.1	4.3	4.1

### Yellowstone

10D11M	Battle Ridge	6020	48	17.6	1/29	14.5	12.7	14.6
10D07M	Northeast Entrance	7350	48	9.4	1/31	7.7	5.6	6.5



# AYAS TRADING CO.

INCORPORATED IN THE STATE OF CALIFORNIA

## MEMORANDUM

No.	Date		Particulars		Balance
	Month	Day	Debit	Credit	
1	Jan	1			
2	Jan	2			
3	Jan	3			
4	Jan	4			
5	Jan	5			
6	Jan	6			
7	Jan	7			
8	Jan	8			
9	Jan	9			
10	Jan	10			
11	Jan	11			
12	Jan	12			
13	Jan	13			
14	Jan	14			
15	Jan	15			
16	Jan	16			
17	Jan	17			
18	Jan	18			
19	Jan	19			
20	Jan	20			
21	Jan	21			
22	Jan	22			
23	Jan	23			
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25	Jan	25			
26	Jan	26			
27	Jan	27			
28	Jan	28			
29	Jan	29			
30	Jan	30			
31	Jan	31			
32	Feb	1			
33	Feb	2			
34	Feb	3			
35	Feb	4			
36	Feb	5			
37	Feb	6			
38	Feb	7			
39	Feb	8			
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42	Feb	11			
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57	Feb	26			
58	Feb	27			
59	Feb	28			
60	Feb	29			
61	Mar	1			
62	Mar	2			
63	Mar	3			
64	Mar	4			
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90	Mar	30			
91	Mar	31			
92	Apr	1			
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116	Apr	25			
117	Apr	26			
118	Apr	27			
119	Apr	28			
120	Apr	29			
121	Apr	30			
122	Apr	30			

# RESERVOIR STORAGE DATA

AS OF JANUARY 31, 1969

(1000 Acre Feet)

			USEABLE STORAGE		
BASIN	RESERVOIR	USEABLE CAPACITY	THIS YEAR	LAST YEAR	AVERAGE
COLUMBIA RIVER BASIN					
Flathead	Hungry Horse	3,428.0	2,902.0	2,034.0	2,474.0
	Flathead Lake	1,791.0	1,184.0	1,272.0	1,186.0
	Camas (Sum of 4)	45.2	14.3	22.4	26.6
	Mission Valley (Sum of 8)	100.3	80.2	24.2	31.0
Clark Fork	Georgetown Lake	31.0	29.4	28.7	25.1
	Nevada Creek	12.6		5.8	4.4
	Noxon Rapids	334.6		325.7	320.2**
Bitterroot	Como	34.9	16.0	14.4	9.3
	Painted Rocks	31.7	29.4	21.8	21.7
MISSOURI RIVER BASIN					
Beaverhead	Clark Canyon	328.9	152.8	156.7	126.5**
	Lima	84.0	44.9	42.1	22.8
Ruby	Ruby	38.8		-	21.1
Madison	Hebgen Lake	377.5	299.5	237.0	168.7
	Ennis Lake	41.0	35.4	34.6	38.4
Gallatin	Middle Creek	8.0	3.5	3.3	3.3
Missouri	Canyon Ferry	2,043.0	1,649.0	1,709.0	1,602.0**
	Hauser & Helena	61.9	63.0	59.0	56.5
	Lake Helena	10.4	10.9	9.4	8.6
	Holter Lake	81.9	51.2	75.4	61.5
	Smith River	10.7	8.0	8.1	5.7
	Durand	7.0	6.1	4.6	4.0
	Martinsdale	23.1	10.6	9.8	6.3
	Deadman's Basin	72.2	46.6	60.4	42.2
	Fort Peck	19,410.0	16,210.0	16,100.0	10,930.0
	Sun	Gibson	105.0	61.9	32.1
Willow Creek		32.2	20.4	16.6	20.4
Pishkun		32.0	17.2	16.7	17.9
Marias	Lower Two Medicine	16.6		-	0.0
	Four Horns	19.2		-	12.1
	Swift	30.0		9.5	17.9
	Lake Frances	112.0	79.5	70.8	83.3
	Tiber	1,313.0	450.2	461.2	625.5**
Milk	Fresno	127.2	86.8	66.8	59.6
	Nelson	66.8	45.2	41.0	42.4
	Lake Sherburne	66.1		24.6	17.9
Yellowstone	Mystic Lake	20.8	12.0	13.5	10.4
	Tongue River	68.0	33.0	30.7	19.9
	Cooney	27.5	18.5	15.0	13.0
Big Horn	Yellowtail	1,356.0	731.8	800.6	-



## Agencies and Organizations Cooperating in Montana Snow Surveys

U. S. Forest Service  
Region I, Missoula, Montana  
Montana Forests and Ranger  
Districts

U. S. Geological Survey  
Helena, Montana  
Portland, Oregon

U. S. Army Corps of Engineers  
Portland, Oregon  
Seattle, Washington  
Walla Walla, Washington  
Omaha, Nebraska

U. S. Indian Irrigation Service  
St. Ignatius, Montana

U. S. Weather Bureau  
Helena, Montana  
Portland, Oregon  
Kansas City, Missouri

U. S. Bureau of Sports Fisheries  
and Wildlife  
Red Rock Lakes Refuge  
Monida, Montana

U. S. Bureau of Reclamation  
Billings, Montana  
Boise, Idaho

U. S. Bonneville Power Administration  
Portland, Oregon

U. S. Soil Conservation Service  
Montana, Wyoming, Idaho

Soil and Water Conservation Districts  
Montana Counties

U. S. National Park Service  
Yellowstone National Park  
Glacier National Park

Montana Power Company  
Butte, Montana

Montana Water Resources Board  
Helena, Montana

North Montana Branch Station  
Agricultural Experiment Station  
Havre, Montana

Montana State University  
Agricultural Experiment Station  
Bozeman, Montana

University of Montana  
School of Forestry  
Missoula, Montana

Water Rights Branch, Dept. of  
Lands and Forests  
Victoria, British Columbia

Department of Energy, Mines and  
Resources  
Calgary, Alberta

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SOIL CONSERVATION SERVICE

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**COOPERATIVE SNOW SURVEYS**

Furnishes the basic data  
necessary for forecasting  
water supply for irrigation,  
domestic and municipal water  
supply, hydro-electric power  
generation, navigation,  
mining and industry

*"The Conservation of Water begins  
with the Snow Survey"*